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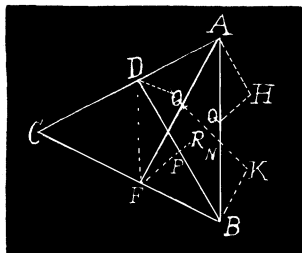
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$\triangle DFB = \triangle DOB$, having two angles and included side of one etc.
 $\therefore BF = BO$. $\therefore BP$ is perpendicular to OF ,
 for a line which bisects the vertical angle of an
 isosceles triangle is perpendicular to the base.
 Similarly $AD = AN$, and AQ is perpendicular to
 ND . \triangle 's DPR and FQR are right-angled at
 P and Q . $\therefore \angle RDP = \angle RQF$. $\therefore \triangle$'s AHF
 and KBD are equal, since they are right-angled at
 B and A , and have a leg and adjacent acute angle
 of one equal respectively to a leg and adjacent
 acute angle of the other.



$\therefore AH = KB$. BK is parallel to HF , and AH is parallel to KD ,
 being perpendicular to the same line. $\therefore \angle KBN = \angle HOA$, and $\angle KNB$
 $= \angle HAO$, being exterior interior angles. $\therefore \angle H = \angle K$.

$\therefore \triangle$'s KNB and HAO are equal, having two angles and included
 side etc. $\therefore AO = NB$. $\therefore AN = OB$. $\therefore AD = BF$. $\therefore \triangle$'s ADF and
 BDF are equal, having three sides respectively equal.

$\therefore \angle DAF = \angle DBF$, and $\therefore \angle A = \angle B$. $\therefore AC = BC$, being op-
 posite equal angles. Q. E. D.

As this problem is one that has frequently been discussed and is of interest
 to mathematicians we shall publish, in the June MONTHLY, two or three more of the
 many excellent solutions we have received. A query from Dr. George Lilley
 says, "It is said that Mr. I. Todhunter proposed the above problem, and that a
 direct or *a priori* proof has not been discovered for it. What is the *a priori*
 proof?—ED.

PROBLEMS.

46. Proposed by GEORGE E. BROCKWAY, Boston, Massachusetts.

If an equilateral triangle is inscribed in a circle, the sum of the squares of
 the lines joining any point in the circumference to the three vertices of the triangle
 is constant.

47. Proposed by J. C. GREGG, Superintendent of Schools, Brazil, Indiana.

Given two points A and B and a circle whose center is O : show that the
 rectangle contained by OB and the perpendicular from B on the polar of A is equal
 to the rectangle contained by OA and the perpendicular from A on the polar of B .